

#5

Sequence Listing

<110> Prof. Dr. Flügge, Ulf-Ingo

<120> DNA-Sequences, which code a glucose-translocator,
Plasmids, Bacteria, Yeasts and Plants containing
This Tranlocator

<130> plastidic glucose transporters

<140> 09/719,168

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<151> 1999-06-13

<160> 6

<170> PatentIn Ver. 2.1

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<212> DNA

<213> Zea mays

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<221> CDS

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 Ser Trp Ser Gly Asp Arg Arg Leu Pro Ala Val Asn Pro Cys Ser Val
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cgg atg ccg acg ggc aac gat ggg tgg tgc gcc ggc ctg agg tcg cgg 145
 Arg Met Pro Thr Gly Asn Asp Gly Trp Cys Ala Gly Leu Arg Ser Arg
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gcg gcg gat ctc gcc ggc ctc gag atg gcc aac ctg cgc ggc ggc gtc 193
 Ala Ala Asp Leu Ala Gly Leu Glu Met Ala Asn Leu Arg Gly Gly Val
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ggg ggg ctc ttc cgc gcg agc ccg cgc tac ggg cgc ttg caa gcc acg 241
 Gly Gly Leu Phe Arg Ala Ser Pro Arg Tyr Gly Arg Leu Gln Ala Thr
 65 70 75 80

gcg gca gtt gac cct gaa gat att cca ttg gag aag gtt caa gtt aaa 289
 Ala Ala Val Asp Pro Glu Asp Ile Pro Leu Glu Lys Val Gln Val Lys
 85 90 95

tcc tca gga cat gtt ctg cca tat gtt ggc gtt gct tgt ttg ggg gct 337
 Ser Ser Gly His Val Leu Pro Tyr Val Gly Val Ala Cys Leu Gly Ala
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att ctg ttt ggt tac cat ctt ggt gtg gtc aat ggc gca ctt gaa tat 385



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Leu	Ala	Val	Gly	Met	Ala	Phe	Ser	Pro	Glu	Ser	Pro	Arg	Trp	Leu	Phe		
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Gln	Gln	Gly	Lys	Val	Thr	Gln	Ala	Glu	Leu	Ala	Val	Lys	Arg	Leu	Tyr		
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Gln Gly Arg Lys Ser Leu Leu Ile Thr Ser Phe Ser Gly Met Gly Ala	
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Ser Met Leu Leu Leu Ala Leu Ser Phe Thr Trp Lys Ala Leu Ala Pro	
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Tyr Ser Gly Thr Leu Ala Val Val Gly Thr Val Leu Tyr Val Leu Ser	
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Ser Lys Phe Gly Ile Ser Asn Val Tyr Leu Gly Phe Ala Ser Val Cys	
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Arg Ser Leu Glu Glu Ile Glu Arg Glu Leu Ser Val Ala Glu	
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 Gly Gly Leu Phe Arg Ala Ser Pro Arg Tyr Gly Arg Leu Gln Ala Thr
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 Ala Ala Val Asp Pro Glu Asp Ile Pro Leu Glu Lys Val Gln Val Lys
 85 90 95
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 Ile Leu Phe Gly Tyr His Leu Gly Val Val Asn Gly Ala Leu Glu Tyr
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 Glu Ile Arg Gly Thr Leu Gly Thr Val Asn Gln Leu Phe Ile Cys Ile
 225 230 235 240
 Gly Ile Leu Ala Ala Leu Leu Ala Gly Leu Pro Leu Ala Gly Asn Pro
 245 250 255
 Ala Trp Trp Arg Thr Met Phe Gly Ile Ala Val Val Pro Ser Ile Leu
 260 265 270
 Leu Ala Val Gly Met Ala Phe Ser Pro Glu Ser Pro Arg Trp Leu Phe
 275 280 285
 Gln Gln Gly Lys Val Thr Gln Ala Glu Leu Ala Val Lys Arg Leu Tyr
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 Gly Lys Glu Met Val Thr Glu Ile Met Phe Asp Leu Arg Ala Ser Gly
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 Arg Tyr Trp Lys Val Val Ser Val Gly Ala Ala Leu Phe Leu Phe Gln
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Gln Leu Ala Gly Ile Asn Ala Val Val Tyr Tyr Ser Thr Ser Val Phe
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 370 375 380
 Ala Ala Asn Val Phe Gly Thr Met Val Ala Ser Ser Leu Met Asp Lys
 385 390 395 400
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 405 410 415
 Ser Met Leu Leu Leu Ala Leu Ser Phe Thr Trp Lys Ala Leu Ala Pro
 420 425 430
 Tyr Ser Gly Thr Leu Ala Val Val Gly Thr Val Leu Tyr Val Leu Ser
 435 440 445
 Phe Ala Leu Gly Ala Gly Pro Val Pro Ala Leu Leu Leu Pro Glu Ile
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 Phe Ala Ser Arg Ile Arg Ala Lys Ala Val Ala Leu Ser Leu Gly Met
 465 470 475 480
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 485 490 495
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 Pro Tyr Val Gly Val Ala Cys Leu Gly Ala Ile Leu Phe Gly Tyr His

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Phe	Gly	Arg	Thr	Lys	Thr	Phe	Ile	Leu	Asp	Ala	Ile	Pro	Leu	Ser	Val	
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Ser	Ile	Gly	Ala	Ala	Met	Phe	Leu	Leu	Gln	Gln	Leu	Ala	Gly	Ile	Asn
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Ala	Val	Val	Tyr	Tyr	Ser	Thr	Ala	Val	Phe	Arg	Ser	Ala	Gly	Ile	Thr
		290				295					300				
Ser	Asp	Val	Ala	Ala	Ser	Ala	Leu	Val	Gly	Ala	Ala	Asn	Val	Phe	Gly
	305				310					315					320
Thr	Thr	Val	Ala	Ser	Ser	Leu	Met	Asp	Lys	Gln	Gly	Arg	Lys	Ser	Leu
			325						330					335	
Leu	Leu	Ile	Ser	Tyr	Thr	Gly	Met	Ala	Ala	Ser	Met	Met	Leu	Leu	Ser

gga ttt gca aga ttg ggt ctt gat cat gtc atg aag tcc tca ccc aag	300
Gly Phe Ala Arg Leu Gly Leu Asp His Val Met Lys Ser Ser Pro Lys	
65 70 75 80	
tac aga tca gtc aag gct caa gct gct tct gga gga gat ctt gaa gat	348
Tyr Arg Ser Val Lys Ala Gln Ala Ala Ser Gly Gly Asp Leu Glu Asp	
85 90 95	
gcc act cct gtc aaa tat caa ggc aaa tct tct gca tca gtg ttg ccg	396
Ala Thr Pro Val Lys Tyr Gln Gly Lys Ser Ser Ala Ser Val Leu Pro	
100 105 110	
tat gtt ggt gtt gct tgt ttg gga gct att ttg ttt gga tat cac ctt	444
Tyr Val Gly Val Ala Cys Leu Gly Ala Ile Leu Phe Gly Tyr His Leu	
115 120 125	
ggt gtg gta aat gga gct ctt gac tac cta tct gcg gat tta gct att	492
Gly Val Val Asn Gly Ala Leu Asp Tyr Leu Ser Ala Asp Leu Ala Ile	
130 135 140	
gct ggc aat act gtt tta caa gga tgg gtt gtg agc ata tta ctt gct	540
Ala Gly Asn Thr Val Leu Gln Gly Trp Val Val Ser Ile Leu Leu Ala	
145 150 155 160	
gga gcg act gta ggt tca ttt act ggc gga tct ttg gct gat aag ttt	588
Gly Ala Thr Val Gly Ser Phe Thr Gly Gly Ser Leu Ala Asp Lys Phe	
165 170 175	
gga agg aca aag acc ttc cag tta gat gca att cct ctt gca ata gga	636
Gly Arg Thr Lys Thr Phe Gln Leu Asp Ala Ile Pro Leu Ala Ile Gly	
180 185 190	
gct tat ctc tgt gcc aca gca caa aat gta cag ata atg atg att ggt	684
Ala Tyr Leu Cys Ala Thr Ala Gln Asn Val Gln Ile Met Met Ile Gly	
195 200 205	
cgt tta ctt tgt ggc att gga att ggc ata tca tct gcc tta gtt ccg	732
Arg Leu Leu Cys Gly Ile gga att ggc ile Ser Ser Ala Leu Val Pro	
210 215 220	
tta tac att tct gag att tcg cca act gaa att cga ggt gca ctt ggt	780
Leu Tyr Ile Ser Glu Ile Ser Pro Thr Glu Ile Arg Gly Ala Leu Gly	
225 230 235 240	
tct gtc aac cag ctt ttt ata tgc att ggt att ctt gcg gct ttg gtt	828
Ser Val Asn Gln Leu Phe Ile Cys Ile Gly Ile Leu Ala Ala Leu Val	
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gct gga ttg cct tta gca gga aac cct ttg tgg tgg agg aca atg ttt	876
Ala Gly Leu Pro Leu Ala Gly Asn Pro Leu Trp Trp Arg Thr Met Phe	
260 265 270	
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Gly Ile Ala Thr Val Pro Ser Val Leu Leu Ala Leu Gly Met Gly Phe	
275 280 285	
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Cys Pro Glu Ser Pro Arg Trp Leu Phe Gln Gln Gly Lys Ile Val Glu	
290 295 300	
gca gaa aag gcc gta gca gcc ctc tat gga aaa gaa agg gtt ccg gag	1020
Ala Glu Lys Ala Val Ala Ala Leu Tyr Gly Lys Glu Arg Val Pro Glu	

305	310	315	320	
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Val Ile Asn Asp Leu Arg Ala Ser Val Gln Gly Ser Ser Glu Pro Glu	325	330	335	
gct ggc tgg ttt gat ctg ttc agt agc cgc tac agg aaa gtg gta agt				1116
Ala Gly Trp Phe Asp Leu Phe Ser Ser Arg Tyr Arg Lys Val Val Ser	340	345	350	
gtt ggt gct gca ctt ttc ttg ttc cag caa atg gca gga atc aat gct				1164
Val Gly Ala Ala Leu Phe Leu Phe Gln Gln Met Ala Gly Ile Asn Ala	355	360	365	
gtt gta tat tac tcc aca tct gta ttc cga agt gct gga att gca tca				1212
Val Val Tyr Tyr Ser Thr Ser Val Phe Arg Ser Ala Gly Ile Ala Ser	370	375	380	
gat gtt gcc gct agt gcc ctt gtt gga gca tca aat gtt att ggc act				1260
Asp Val Ala Ala Ser Ala Leu Val Gly Ala Ser Asn Val Ile Gly Thr	385	390	400	
gct gtc gcc tct tct tta atg gac aag caa gga aga aag agc cta ctg				1308
Ala Val Ala Ser Ser Leu Met Asp Lys Gln Gly Arg Lys Ser Leu Leu	405	410	415	
atg aca agt ttc tca gga atg gct gcc tca atg ttg ttg ctg tca cta				1356
Met Thr Ser Phe Ser Gly Met Ala Ala Ser Met Leu Leu Leu Ser Leu	420	425	430	
tcg ttc aca tgg aag gct cta gca cct tac tcg ggc aca ctt gcc gtt				1404
Ser Phe Thr Trp Lys Ala Leu Ala Pro Tyr Ser Gly Thr Leu Ala Val	435	440	445	
gtg gga act gtt tta tat gtc ctt tcc ttt tca ctt ggc gct ggt cct				1452
Val Gly Thr Val Leu Tyr Val Leu Ser Phe Ser Leu Gly Ala Gly Pro	450	455	460	
gtt cct gct ctt cta ctt cca gag atc ttc gca tcc aga atc cga gca				1500
Val Pro Ala Leu Leu Leu Pro Glu Ile Phe Ala Ser Arg Ile Arg Ala	465	470	480	
aaa gca gtg gct ttg tca ctg gga atg cat tgg gcg tca aac ttc gta				1548
Lys Ala Val Ala Leu Ser Leu Gly Met His Trp Ala Ser Asn Phe Val	485	490	495	
att ggc ctt tat ttc tta agt gtg gtg acc aag ttt gga atc agc aaa				1596
Ile Gly Leu Tyr Phe Leu Ser Val Val Thr Lys Phe Gly Ile Ser Lys	500	505	510	
gtg tat ttg ggg ttc gcg tca gtg tgt gtg ctt gcc gtg ttg tac ata				1644
Val Tyr Leu Gly Phe Ala Ser Val Cys Val Leu Ala Val Leu Tyr Ile	515	520	525	
gct ggt aac gtt gtt gaa aca aaa gga cga tca ctt gag gaa ata gag				1692
Ala Gly Asn Val Val Glu Thr Lys Gly Arg Ser Leu Glu Glu Ile Glu	530	535	540	
ctt gct cta agt cca gct gtt tag tttggaggat acagtttttc tgtttttttg				1746
Leu Ala Leu Ser Pro Ala Val	545	550		
atctatagag aattatgtta ataattcccg gatttaggag tttgatgcta gttttcatgc 1806				

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<210> 6

<211> 551

<212> PRT

<213> Spinacia oleracea

<400> 6

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Gln	Asn	Arg	Arg	Val	Ala	Gly	Leu	Ala	Gly	Leu	Lys	Gly	Leu	Ser	Ser	
			20					25					30			
Ile	Arg	Ser	Asn	Asn	Leu	Ser	Phe	Val	Asn	Val	Asn	Asp	Asn	Asn	Tyr	
		35					40					45				
Lys	Ser	Asn	Pro	Cys	Lys	Leu	Ser	Cys	Gly	Ser	Leu	Ser	Met	Gly	Ala	
	50					55					60					
Gly	Phe	Ala	Arg	Leu	Gly	Leu	Asp	His	Val	Met	Lys	Ser	Ser	Pro	Lys	
65					70					75					80	
Tyr	Arg	Ser	Val	Lys	Ala	Gln	Ala	Ala	Ser	Gly	Gly	Asp	Leu	Glu	Asp	
				85					90					95		
Ala	Thr	Pro	Val	Lys	Tyr	Gln	Gly	Lys	Ser	Ser	Ala	Ser	Val	Leu	Pro	
			100					105					110			
Tyr	Val	Gly	Val	Ala	Cys	Leu	Gly	Ala	Ile	Leu	Phe	Gly	Tyr	His	Leu	
	115						120					125				
Gly	Val	Val	Asn	Gly	Ala	Leu	Asp	Tyr	Leu	Ser	Ala	Asp	Leu	Ala	Ile	
	130					135					140					
Ala	Gly	Asn	Thr	Val	Leu	Gln	Gly	Trp	Val	Val	Ser	Ile	Leu	Leu	Ala	
145					150					155					160	
Gly	Ala	Thr	Val	Gly	Ser	Phe	Thr	Gly	Gly	Ser	Leu	Ala	Asp	Lys	Phe	
				165					170					175		
Gly	Arg	Thr	Lys	Thr	Phe	Gln	Leu	Asp	Ala	Ile	Pro	Leu	Ala	Ile	Gly	
			180					185					190			
Ala	Tyr	Leu	Cys	Ala	Thr	Ala	Gln	Asn	Val	Gln	Ile	Met	Met	Ile	Gly	
	195						200					205				
Arg	Leu	Leu	Cys	Gly	Ile	Gly	Ile	Gly	Ile	Ser	Ser	Ala	Leu	Val	Pro	
	210					215					220					
Leu	Tyr	Ile	Ser	Glu	Ile	Ser	Pro	Thr	Glu	Ile	Arg	Gly	Ala	Leu	Gly	
225					230					235					240	
Ser	Val	Asn	Gln	Leu	Phe	Ile	Cys	Ile	Gly	Ile	Leu	Ala	Ala	Leu	Val	
				245					250					255		
Ala	Gly	Leu	Pro	Leu	Ala	Gly	Asn	Pro	Leu	Trp	Trp	Arg	Thr	Met	Phe	
			260					265						270		
Gly	Ile	Ala	Thr	Val	Pro	Ser	Val	Leu	Leu	Ala	Leu	Gly	Met	Gly	Phe	
	275						280						285			

Cys	Pro	Glu	Ser	Pro	Arg	Trp	Leu	Phe	Gln	Gln	Gly	Lys	Ile	Val	Glu	290	295	300
Ala	Glu	Lys	Ala	Val	Ala	Ala	Leu	Tyr	Gly	Lys	Glu	Arg	Val	Pro	Glu	305	310	315
Val	Ile	Asn	Asp	Leu	Arg	Ala	Ser	Val	Gln	Gly	Ser	Ser	Glu	Pro	Glu	325	330	335
Ala	Gly	Trp	Phe	Asp	Leu	Phe	Ser	Ser	Arg	Tyr	Arg	Lys	Val	Val	Ser	340	345	350
Val	Gly	Ala	Ala	Leu	Phe	Leu	Phe	Gln	Gln	Met	Ala	Gly	Ile	Asn	Ala	355	360	365
Val	Val	Tyr	Tyr	Ser	Thr	Ser	Val	Phe	Arg	Ser	Ala	Gly	Ile	Ala	Ser	370	375	380
Asp	Val	Ala	Ala	Ser	Ala	Leu	Val	Gly	Ala	Ser	Asn	Val	Ile	Gly	Thr	385	390	395
Ala	Val	Ala	Ser	Ser	Leu	Met	Asp	Lys	Gln	Gly	Arg	Lys	Ser	Leu	Leu	405	410	415
Met	Thr	Ser	Phe	Ser	Gly	Met	Ala	Ala	Ser	Met	Leu	Leu	Leu	Ser	Leu	420	425	430
Ser	Phe	Thr	Trp	Lys	Ala	Leu	Ala	Pro	Tyr	Ser	Gly	Thr	Leu	Ala	Val	435	440	445
Val	Gly	Thr	Val	Leu	Tyr	Val	Leu	Ser	Phe	Ser	Leu	Gly	Ala	Gly	Pro	450	455	460
Val	Pro	Ala	Leu	Leu	Leu	Pro	Glu	Ile	Phe	Ala	Ser	Arg	Ile	Arg	Ala	465	470	475
Lys	Ala	Val	Ala	Leu	Ser	Leu	Gly	Met	His	Trp	Ala	Ser	Asn	Phe	Val	485	490	495
Ile	Gly	Leu	Tyr	Phe	Leu	Ser	Val	Val	Thr	Lys	Phe	Gly	Ile	Ser	Lys	500	505	510
Val	Tyr	Leu	Gly	Phe	Ala	Ser	Val	Cys	Val	Leu	Ala	Val	Leu	Tyr	Ile	515	520	525
Ala	Gly	Asn	Val	Val	Glu	Thr	Lys	Gly	Arg	Ser	Leu	Glu	Glu	Ile	Glu	530	535	540
Leu	Ala	Leu	Ser	Pro	Ala	Val										545	550	